

Amendments to the Drawings:

The drawing sheet attached in connection with the above-identified application containing FIG. 1 is being presented as a sheet to be substituted for the previously submitted drawing sheet. FIG. 1 has been amended. Appended to this amendment is an annotated copy of the previous drawing sheet which has been marked to show changes presented in the replacement sheet of the drawing.

The specific changes which have been made to FIG. 1 are as follows:

- (1) Return spring 2d has been added within primary-pulley chamber 2c
- (2) Reference numerals "2d," "3a," and "3d" and their respective leader lines have been added.

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 1-17 are now pending in this application.

Applicant wishes to thank the Examiner for the careful consideration given to the claims.

Drawings

FIG. 1 has been amended to include the return spring 2d within the primary-pulley chamber 2c. Reference numerals “2d,” “3a,” and “3d” and their respective leader lines have also been added. The addition of the return spring 2d is supported by FIG. 1 of the prior Japanese Patent Application, 2002-288396 filed Oct. 1, 2002, which had been incorporated by reference, and paragraph 0018 of the specification, which specifically describes “one of the flanges for defining the V-groove of each of the primary and secondary pulleys 2, 3 includes a stationary flange 2a, 3a” and “return springs 2d, 3d are arranged in the primary-pulley and secondary-pulley chambers 2c, 3c, respectively.”

Rejection of claim 12 based on 35 U.S.C. 112

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the term “fixing” is not clear as to what “fixing” is related to and what is being fixed. Claim 13 has been amended to make clear that it is the shift actuator that is being fixed. For at least this reason, favorable reconsideration is respectfully requested.

Rejection of claims 1-3, 5-9, and 11-13 based on Okahara and Lardy

Claims 1-3, 5-9, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,249,482 (“Okahara”) in view of U.S. Patent 5,624,348 (“Lardy”). For at least the following reasons, this rejection is traversed.

Claim 1 (as amended) recites an ECU being programmed so as to:

determine if the primary-pulley pressure reaches a predetermined value within a predetermined period after a start of the engine; and

move the shift actuator to a first position corresponding to a first target shift ratio if it is determined that the primary-pulley pressure fails to reach the predetermined value within the predetermined period, the first position being on a high-speed side with respect to a second position to be occupied by the shift actuator when the primary-pulley pressure reaches the predetermined

value within the predetermined period, and being close to the predetermined shift ratio during tractive cruising of the vehicle.

Okahara, Lardy, or any combination thereof fails to teach or suggest this combination of features as detailed below.

When an engine of a vehicle is started after tractive cruising, the shift control system for controlling shift operation of the CVT, which cannot detect the shift ratio during tractive cruising, actuates the shift actuator in the same manner as at ordinary start of the engine. In such a case, the shift actuator operates on the assumption that the pulley ratio is close to the lowest ratio. However, with the primary pulley not located at the lowest position and the step motor located at the lowest position as the fulcrums, the shift link is positioned to make the shift control valve permit fluid communication between a drain port and a primary port. Thus, the primary-pulley pressure is not supplied to the primary pulley until the vehicle cruises to drive the step motor in the upshift direction, thereby causing a possible occurrence of belt slippage due to downshift and insufficient primary-pulley pressure, thus leading to a reduction in durability of the V-belt. Accordingly, it is an object of the present invention to provide a system and method of controlling a V-belt type CVT, which can prevent a reduction in durability of the V-belt due to downshift and belt slippage even when starting the engine of the vehicle after tractive cruising.

In view of this object, claim 1 recites features that include at least by a process of conforming a shift ratio obtained from a rotational-speed ratio between the primary and secondary pulleys to a target shift ratio; determining if the primary-pulley pressure reaches a predetermined value within a predetermined period after a start of the engine; and moving the shift actuator to a first position corresponding to a first target shift ratio if it is determined that the primary-pulley pressure fails to reach the predetermined value within the predetermined period, the first position being on a high-speed side with respect to a second position to be occupied by the shift actuator when the primary-pulley pressure reaches the predetermined value within the predetermined period, and being close to the predetermined shift ratio during tractive cruising of the vehicle.

Okahara, in contrast, is based on a problem that according to a known ratio control, a limit is imposed on suppressing overshoot in the turbine revolution speed at rapid acceleration of a vehicle from a standstill after a throttle opening degree has been increased rapidly. This is derived from the fact that the maximum reduction ratio is kept until the

vehicle speed reaches an upshift vehicle speed predetermined by a shift pattern and thus the turbine revolution speed is subject to a rapid increase in the vicinity of this upshift vehicle speed. Accordingly, Okahara has an object to improve a ratio control such that the overshoot mentioned above is suppressed or reduced satisfactorily. Thus, Okahara does not teach or suggest an ECU programmed to move the shift actuator to a first position corresponding to a first target shift ratio if it is determined the that primary-pulley pressure fails to reach the predetermined value within the predetermine period after a start of the engine.

Lardy does not cure the deficiency of Okahara. Lardy relates to a process for controlling a change of the transmission ratio in an infinitely variable transmission, which simulates a stepped transmission, and has an object to provide a method and apparatus for determining such a shifting time in such a manner that the shifting comfort is adapted to a driver's feeling of comfort. A basic shifting time is determined separately for each shifting position and direction. In addition, a rotational speed factor is used to take into account the change of the rotational input speed of the transmission caused by the change of the transmission ratio. A lead factor reflects the lead existing at the transmission input. Shifting of the infinitely variable transmission is then performed as a function of the basic shifting time, the rotational speed factor and the lead factor. Thus, Lardy does not teach or suggest an ECU programmed to move the shift actuator to a first position corresponding to a first target shift ratio if it is determined the that primary-pulley pressure fails to reach the predetermined value within the predetermine period after a start of the engine.

In view of the above, claim 1 is not rendered unpatentable over Okahara and Lardy.

Claim 5 (as amended) requires an ECU programmed to “determine if a tractive cruising of the vehicle is carried out during a stop of the engine; and move the shift actuator to a first position corresponding to a first target shift ratio if it is determined that the tractive cruising is carried out during the stop of the engine, the first position being on a high-speed side with respect to a second position to be occupied by the shift actuator when the tractive cruising fails to be carried out during the stop of the engine, and being close to the predetermined shift ratio during tractive cruising of the vehicle.” Okahara, Lardy, or any combination thereof fails to teach or suggest this combination of features. Okahara and Lardy do not teach or suggest moving the shift actuator to a position based on whether the tractive cruising is carried out during the stop of the engine. Indeed, Okahara and Lardy do not even

mention an ECU that determines if a tractive cruising of the vehicle is carried out during a stop of a vehicle. Thus, Okahara and Lardy do not render claim 5 unpatentable.

Claim 11 recites a method comprising the steps of “determining if the primary-pulley pressure reaches a predetermined value within a predetermined period after a start of the engine; and moving the shift actuator to a first position corresponding to a first target shift ratio if it is determined that the primary-pulley pressure fails to reach the predetermined value within the predetermined period, the first position being on a high-speed side with respect to a second position to be occupied by the shift actuator when the primary-pulley pressure reaches the predetermined value within the predetermined period, and being close to the predetermined shift ratio during tractive cruising of the vehicle.” As previously mentioned, Okahara and Lardy do not teach or suggest the step of moving the shift actuator to a first position corresponding to a first target shift ratio if it is determined the that primary-pulley pressure fails to reach the predetermined value within the predetermine period after a start of the engine. Thus, Okahara and Lardy do not render claim 11 unpatentable.

Claims 2-3, 6-9, and 12-13 depend from and contain all the limitations of either claim 1, 5, or 11, and are allowable therewith for at least the same reasons provided above without regard to the further patentable features contained therein.

For at least these reasons, favorable reconsideration is respectfully requested.

Rejection of claims 4, 10, and 14 based on Okahara, Lardy, and Murano

Claims 4, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okahara in view of Lardy and U.S. Patent 5,042,323 (“Murano”). Claims 4, 10, and 14 depend from and contain all the features of either claim 1, 5, or 11. As previously mentioned, Okahara, Lardy, or any combination thereof does not teach or suggest all the features of claims 1, 5, and 11. Murano does not cure these deficiencies because Murano has an object to provide a hydraulic control method for a continuously variable speed change gear mechanism in which, by switching a driving frequency of a pressure control valve arrangement for controlling an oil pressure in accord with an oil temperature, a proper oil pressure is assured even at low temperatures. Also, a clutch pressure and the like are maintained at proper values, thereby improving the operability. Thus, Murano merely discloses, when the oil temperature is low, the duty ratio or driving frequency of an associated pressure control valve is altered. Because Murano does not cure the deficiencies of Okahara

and Lardy, claims 4, 10, and 14 are not rendered unpatentable over the prior art. For at least these reasons, favorable reconsideration is respectfully requested.

Allowability of new claims 15-17

Claims 15-17 depend from and contain all the limitations of either claim 1, claim 5, or claim 11, and are allowable therewith for at least the same reasons provided above without regard to the further patentable features contained therein.

Conclusion

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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By Matthew J. Kremer

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 945-6162
Facsimile: (202) 672-5399

Pavan K. Agarwal
Registration No. 40,888

Matthew J. Kremer
Registration No. 58,671

FIG.1

